

Amazon Rainforest Collapse?

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'A major question is whether a large-scale collapse of the Amazon forest system could actually happen within the twenty-first century.' (Source: Bernardo M. Flores, et al, "Critical Transitions in the Amazon Forest System", Nature, February 14, 2024).

It may seem absurd to consider collapse of the Amazon rainforest (65-million-years-old) which seems impossible, too far out, not warranting an article like this, but, sorry to say, it is already happening in early stages, as explained herein in some detail, with facts.

In fact, peer-reviewed studies of ecosystems such as (1) Greenland (2) the Great Barrier Reef (3) vast permafrost regions of the Northern Hemisphere upper latitudes define risks combined with (4) the Amazon rainforest could result in a synchronized collapse 1,2,3,4 sometime in the future, who knows, but it's headed in that direction. All four are noticeably breaking down; no doubt about it, 100% factual. It would likely be geologically catastrophically quick. Each of these tottering ecosystems is negatively impacted by human-generated global warming via fossil fuel emissions, CO2. And it's happening fast.

The potential collapse of the iconic Amazon, one of the planet's biggest, best-known ecosystems, arises after years of failure by world leaders to listen to scientists' warnings to do something about fossil fuel CO2. As a result, by ignoring science, society is its own worst enemy, in denial, unapproachable denial.

A recent Earth.org headline reflects the sobering facts found in the Flores study of the Amazon and supports the uncanny proposition of a potential synchronized collapse of ecosystems: 'Up to 47% of Amazon Rainforest at Risk of Collapse by Mid-Century Due to 'Unprecedented Stress' from Global Warming and Deforestation,' Earth.org, February 15, 2024.

The Flores study is the first-ever major study to focus on a range of forcings impacting the world's most famous rainforest. Previous research only assessed individual forcing aspects without looking at the entire picture. 'This study adds it all up to show how this tipping point is closer than other studies estimated,' said Carlos Nobre, an author of the study.' (Source: Manuela Andreoni, "A Collapse of the Amazon Could Be Coming 'Faster Than We Thought'," The New York Times, February 14, 2024).

The Flores study combined with NASA research of droughts occurring so frequently that the Amazon no longer has enough time to heal, depict a tenuous ecosystem that could turn the global climate system upside down, putting

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civilization into a state of stress and confusion. Already, portions of southeastern Amazon have experienced large-scale deforestation that's past the point of recovery.

'The collapse of part or all the Amazon rainforests would release the equivalent of several years' worth of global emissions, possibly as much as 20 years' worth, into the atmosphere as its trees, which store vast amounts of carbon, are replaced by degraded ecosystems. And, because those same trees pump huge amounts of water into the atmosphere, their loss could also disturb global rainfall patterns and temperatures in ways that aren't well understood.' (Ibid.)

The Flores study outlines parameters for the rainforest to survive: (1) global warming not to exceed 1.5C, (2) deforestation kept below 10% of original tree cover, (3) annual dry season cannot exceed five months for the forest to stay intact. 'If you pass those thresholds, then the forest could, in principle, collapse or transition into different ecosystems'. (Ibid.)

{Footnote to Prior Paragraph: According to the World Wildlife Foundation, 17% of the forest is already lost with another 17% degraded. The Council on Foreign Relations claims 20% has been destroyed over 50 years. According to a recent study in Nature d/d March 1, 2024: 'The combined effects of land use change and global warming resulted in a mean annual rainfall reduction of 44% and a dry season length increase of 69%, when averaged over the Amazon basin Savannization and climate change, via increasing dry-season length and drought frequency, might have already pushed the Amazon close to a critical threshold of rainforest dieback. Increases in the length of the dry season have been reported in several recent studies.'}

Are the three above-stated parameters for rainforest survival achievable?

The Flores study says governments must halt carbon emissions and deforestation and somehow restore 5% of the degraded rainforest to keep the ecosystem alive and functioning as a rainforest. Yet, the parameters are threatened: 'Dry season mean temperature is now more than 2 C higher than it was 40 years ago in large parts of the central and southeastern Amazon. If trends continue, these areas could potentially warm by over 4 C by 2050.' (Flores)

'Keeping the Amazon forest resilient depends firstly on humanity's ability to stop greenhouse gas emissions, mitigating the impacts of global warming on regional climatic conditions.' (Flores) Indeed, this is the problem of all problems as fossil fuel producers are intent on increasing production over the foreseeable future into 2050. The health of the Amazon rainforest is not a consideration in oil and gas company business plans.

Yet already, 'the northwestern portion of the biome (in Amazonas and Roraima states) and in the interior of the Para state, as well as other parts of Brazil, such as the semiarid region of Bahia state, in the northeast, and Mato Grosso do Sul state in the savanna biome, have already seen extreme temperature increases of more than 3 C (5.4F) just since the 1960s.' (Source: "Detailed NASA Analysis Finds Earth and Amazon in Deep Climate Trouble", Mongabay, December 21, 2023).

This 'deep climate trouble' statement made by NASA reflects insanely fast temperature increases, and GRACE satellite groundwater readings in dangerous red zones with severe bouts of drought so frequent that the rainforest no longer snaps back, never seen before in NASA's data base. The Amazon rainforest is truly a victim of excessive global warming. All arrows point down.

Moreover, in addition to too much CO₂: 'Real-time satellite monitoring shows that so far in 2024, more than 10,000 wildfires have ripped across 11,000 square kilometers of the Amazon, across multiple countries, never have this many fires burned so much of the forest this early in the year.' (Source: "Fires Imperil the Future of the Amazon Rainforest", Mother Jones, March 18, 2024.) This info is based upon Brazil's own National Institute for Space Research, as excessive wildfires weaken the forests and emit CO₂ in competition with human CO₂ emissions.

Roraima, which is Brazil's northernmost state within the rainforest and known for its 'wet-wet climate' positioned above the equator naturally suppresses forest fires because of its 'wetness.' However, in late February, according to NASA satellites, widespread intense fire activity 5-times the average for February and 50% above the previous

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record number of fires. According to Copernicus Atmosphere Monitoring Service: 'The intensity and size of many of the fires are also unusual.' It's dry, it burns.

Equally concerning for Roraima, during a normal year the fires only cover a few square kilometers, but this year the fires that began in fragmented regions of the rainforest of pastures and recently cleared forest spread into surrounding areas, burning hundreds of square kilometers, not just a 'few.' (Source; Shane Coffield, postdoc at NASA Goddard Space Flight Center).

'A new NASA study shows that over the last 20 years, the atmosphere above the Amazon rainforest has been drying out, increasing the demand for water, and leaving ecosystems vulnerable to fires and drought. It also shows that the increase in dryness is primarily the result of human activities.' ("Human Activities Are Drying Out the Amazon: NASA Study", Vital Signs of the Planet, NASA.)

'Indeed, despite global efforts to protect forest land, deforestation is still rampant, with around 15% of the Amazon already cleared, 17% degraded by human activities such as logging, fires, and under-canopy extraction, and a further 38% at risk due to prolonged droughts. About a third of global tropical deforestation occurs in Brazil's Amazon forest, amounting to 1.5 million hectares each year.' (Earth.org)

Based upon simple arithmetic from the preceding paragraph, 70% of the rainforest is (a) already cleared (b) degraded by human activities (c) at further risk due to prolonged droughts. Not a good score card. In fact, horrible.

There are solutions, which have been harped upon by climate scientists for decades, stop fossil fuel emissions, stop CO2 which is 76% of greenhouse gases. At the risk of being overly didactic, world leaders need to consider ramifications when skirting the original precepts of the Paris 2015 climate accord to take bold measures to commence halting CO2 emissions more seriously by 2030 to hold global warming in check at 1.5C pre-industrial, especially as major ecosystems of the world are fast approaching the cliff's edge with global temperatures knocking on the 1.5C door (assuming IPCC decadal calculations for 1.5C) although 1.5C seems to be here now.

Should world leaders, more than 100 typically attend UN climate conferences, 'go to the ends of the earth' to demand sticking to the Paris climate accords of 2015 instead of attending the conference just for photo ops with Bono?

Answer: Absolutely, Yes!

The post Amazon Rainforest Collapse? first appeared on Dissident Voice .

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